

REMARKS

Claims 1-32 are pending in the application. Claims 1-32 have been examined. Claims 1, 2, 8, 20, 23 and 30-32 are rejected. Claims 3, 4, 9-19, 21, 22, and 26-29 are allowable. Claims 5-7 and 24-25 are objected to. Claims 1, 30, and 32 have been amended to more clearly define the invention. Reconsideration and allowance of the claims are respectfully requested.

THE CLAIMS

Allowable Claims 3, 4, 9-19, 21, 22, and 26-29

Applicants note with appreciation the indication of allowable claims 3, 4, 9-19, 21, 22, and 26-29.

Objection to Claims 5-7 and 24-25

Claims 5-7 and 24-25 are objected to as being dependent on a rejected base claim, but would be allowable if rewritten in independent form. Applicants would like to defer making amendment to these claims until the next response.

Rejection of Claims 1, 2, 20, 23 and 30-32 Under 35 U.S.C. §102(b)

Claims 1, 2, 20, 23 and 30-32 stand rejected under 35 U.S.C. §102(b) as being anticipated by the admitted prior art. The rejection states that the prior art described in the specification discloses all of the limitations of these claims.

Admitted Prior Art

The rejection cites the following section on page 2 lines 19-23 of the specification:

“Floating-point numbers in the range between the negative and positive minimum normalized numbers other than zero (i.e., $-a_{\min} < y < +a_{\min}$, and $y \neq 0$) may be represented using denormalized numbers. Zero is represented by a mantissa having a value of zero and an exponent also having a value of zero.”

Present Invention

Claim 1 of the present invention, as amended, recites:

“A floating-point unit (FPU) configurable to perform floating-point operations, comprising:

an operand processing section operative to, for each floating-point operation, receive and process one or more input operands to provide a preliminary result comprised of a mantissa and an exponent; and

an operand flush section coupled to the operand processing section and operative to check at least the exponent of the preliminary result to determine whether the preliminary result falls within one of a plurality of ranges of denormalized values between zero and a minimum normalized floating-point number, a_{\min} , wherein each range of denormalized values is associated with a respective set value defined by a particular exponent value and a particular mantissa value, and

if the preliminary result falls within one of the plurality of ranges of denormalized values, set the preliminary result to the set value associated with the range of denormalized values within which the preliminary result falls.”

Applicants submit that claim 1 is not anticipated by the admitted prior art for at least the following reasons.

First, the admitted prior art does not describe nor suggest an operand flush section operative to “... determine whether the preliminary result falls within one of a plurality of ranges of denormalized values between zero and a minimum normalized floating-point number, a_{\min} .” The rejection suggests that the admitted prior art performs a check to determine whether the preliminary result is zero, in which case both the mantissa and the exponent are set to zero. The rejection also suggests that the admitted prior art determines whether the preliminary result falls within one of two ranges of denormalized values, the first range being from $-a_{\min}$ to zero and the second range being from zero to $+a_{\min}$. However, these two ranges are between $-a_{\min}$ and $+a_{\min}$, and there is only one range between zero to $+a_{\min}$. In contrast, claim 1 recites a plurality of ranges of denormalized values between zero and a_{\min} .

Second, the admitted prior art does not describe nor suggest “each range of denormalized values is associated with a respective set value.” The admitted prior art does not have a set value for the first range from $-a_{\min}$ to zero or a set value for the second range from zero to $+a_{\min}$.

Third, the admitted prior art does not describe nor suggest to “set the preliminary result to the set value associated with the range of denormalized values within which the preliminary result falls.” The admitted prior art states that floating-point

numbers between $-a_{\min}$ to zero and between zero to $+a_{\min}$ may be represented with denormalized numbers. However, the admitted prior art does not describe nor suggest setting a preliminary result to different set values for different ranges of denormalized values.

For at least the above reasons, Applicants submit that claim 1 of the present invention is not anticipated by the admitted prior art.

Independent claims 20, 23 and 30-32 each recite features similar to that described above for claim 1. For example, claims 20, 23, and 31 each recites “first or second range of denormalized values between zero and a minimum normalized floating-point number.” In claims 20 and 31, the first range is associated with zero and the second range is associated with a set value. In claim 23, the first and second ranges are associated with first and second set values.

Claims 30 and 32 each recites “plurality of ranges of denormalized values between zero and a minimum normalized floating-point number,” “each range of denormalized values is associated with a respective set value,” and “the preliminary result is set, if at all, to the set value associated with the range of denormalized values within which the preliminary result falls.” All of these features are not described nor suggested by the admitted prior art.

Applicants submit that these independent claims are not anticipated by the admitted prior art for reasons similar to those noted above for claim 1.

Claim 2 is dependent on claim 1 and is not anticipated by the admitted prior art for at least the reasons noted above for its base claim.

Accordingly, the §102(b) rejection of claims 1, 2, 20, 23 and 30-32 should be withdrawn.

Rejection of Claim 8 under U.S.C. §103(a)

Claim 8 stands rejected under 35 U.S.C. §103(a) as being obvious over the admitted prior art.

Claim 8 is dependent on claim 1, which Applicants submit is not anticipated by the admitted prior art for the reasons noted above. Applicants submit that claim 8 is patentable for at least the reasons note for its base claim.

Accordingly, the §103(a) rejection of claim 8 should be withdrawn.

CONCLUSION

Applicants believe all claims now pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at (650) 289-0600.

Respectfully submitted,



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